U. S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1566

Oyster Tissue

This Standard Reference Material is intended primarily for use in calibrating instrumentation and validating methodology for the chemical analysis of marine animal tissue.

Certified Values of Constituent Elements: The certified values for the constituent elements are shown in Table 1. Certified values are based on results obtained by reference methods of known accuracy; or alternatively, from results obtained by two or more independent and reliable analytical methods. Non-certified values are given for information only in Table 2. All values are based on a minimum sample size of 250 mg of the dried material.

NOTICE AND WARNINGS TO USERS

Expiration of Certification: This certification is invalid after 5 years from the date of shipping. Should it become invalid before then, purchasers will be notified by NBS.

Storage: The material should be kept tightly closed in its original bottle and stored in a desiccator at temperatures between 10-30 °C. It should not be exposed to intense sources of radiation, including ultraviolet lamps or sunlight.

Use: A minimum sample weight of 250 mg of the *dried* material (see Instructions for Drying) is necessary for any certified value in Table 1 to be valid within the stated uncertainty. The bottle should be shaken well before each use, and closed tightly immediately after use.

The statistical analysis of the data was performed by K. R. Eberhardt and H. H. Ku of the Statistical Engineering Division.

The overall direction and coordination of the analytical chemistry measurements leading to this certificate were performed in the NBS Center for Analytical Chemistry by P. D. LaFleur.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R. Alvarez.

Washington, D.C. 20234
February 22, 1983
(Revision of Certificate
Dated 12-12-79)

George A. Uriano, Chief
Office of Standard Reference Materials

(over)

Table 1. Certified Values of Constituent Elements

Element[1]	Content[2], Wt. Percent	Element[1]	Content[2], Wt. Percent
Calcium[b,d]	0.15 ± 0.02	Potassium[d]	0.969 ± 0.005
Magnesium[a,d]	0.128 ± 0.009	Sodium[b,f]	0.51 ± 0.03
Element[1]	**Content[2], μg/g**	**Element[1]**	**Content[2], μg/g**
Arsenic[a,f,g,h]	13.4 ± 1.9	Nickel[a,e,h]	1.03 ± 0.19
Cadmium[a,d,e,f,h]	3.5 ± 0.4	Rubidium[d,f]	4.45 ± 0.09
Chromium[d,e,f]	0.69 ± 0.27	Selenium[a,e,f]	2.1 ± 0.5
Copper[a,c,e,f]	63.0 ± 3.5	Silver[a,f]	0.89 ± 0.09
Iron[b,c,e,f]	195 ± 34	Strontium[b,d]	10.36 ± 0.56
Lead[a,d,e,h]	0.48 ± 0.04	Uranium[d]	0.116 ± 0.006
Manganese[a,c,f]	17.5 ± 1.2	Vanadium[d]	2.3 ± 0.1
Mercury[a,f]	0.057 ± 0.015	Zinc[a,c,d,e,f,h]	852 ± 14

1. Analytical Methods:
   - [a] Atomic absorption spectroscopy
   - [b] Atomic emission spectroscopy, flame
   - [c] Atomic emission spectroscopy, inductively coupled plasma
   - [d] Isotope dilution mass spectrometry, thermal ionization
   - [e] Isotope dilution mass spectrometry, spark source
   - [f] Neutron activation
   - [g] Photon activation
   - [h] Polarography

2. Based on dry weight. (For drying instructions, see the section of this certificate on Instructions for Drying.) The estimated uncertainty is given as 95 percent tolerance limits for coverage of at least 95 percent of the measured values of all bottles of SRM 1566. For a given element, the following statement can be made at a confidence limit of 95 percent. "If the concentrations were measured for all bottles, at least 95 percent of these measured values should fall within the indicated limits." The concept of tolerance limits is discussed in Chapter 2, Experimental Statistics, NBS Handbook 91, 1966, and page 14, The Role of Standard Reference Materials in Measurement Systems, NBS Monograph 148, 1975.

Table 2. Non-certified Values of Constituent Elements

Element	Content[1] (Wt. Percent)
Chlorine	(1.0)
Sulfur	(0.76)
Phosphorous	(0.81)
	(μg/g)
Bromine	(55)
Cobalt	(0.4)
Fluorine	(5.2)
Iodine	(2.8)
Molybdenum	(≤0.2)
Thallium	(≤0.005)
Thorium	(0.1)

[1] Based on dry weight. (For drying instructions, see the section of this certificate on Instructions for Drying.)

Instructions for Drying: Before weighing, samples of SRM 1566 should be dried to constant weight by one of the following procedures:

1. Reduced-pressure drying at room temperature for 48 hours over $Mg(ClO_4)_2$ in a vacuum desiccator at approximately 1.3×10^4 Pa (100 mm Hg).
2. Vacuum drying at room temperature for 24 hours at a pressure of approximately 30 Pa (0.2 mm Hg) using a cold trap.
3. Freeze drying for 20 hours at a pressure of approximately 3 Pa (0.02 mm Hg).

Source and Preparation of Material: The oysters for this reference material were obtained by the FDA Bureau of Shellfish Sanitation from a commercial source. They had been shucked, frozen, and packaged in sealed plastic bags. The oyster material was ground, freeze-dried, and powdered at the U.S. Army Natick Research and Development Command, Natick, Mass., under the direction of L. Hinnegardt and G. C. Walker. At NBS, preliminary analyses of the material homogeneity indicated that an improvement in homogeneity would be required to establish more reliable certified values for a minimum sample size of 250 mg. Accordingly, the material was cryogenically ground by J. R. Moody and J. Matwey. It was then blended and bottled at NBS, after which it was again freeze-dried at the Natick, Mass., laboratory.

Homogeneity Assessment: Randomly selected bottles of SRM 1566 were sampled and tested for homogeneity by neutron activation and atomic absorption spectrometry. No inhomogeneity was observed for the following elements determined by neutron activation: Na, Cl, V, and Mn. The values for Mg, K, Cu, Zn, and Cd determined by atomic absorption spectrometry were within the imprecision of the method; however, Ca does exhibit some inhomogeneity--approximately 4% relative standard deviation.

Analysts:

Center for Analytical Chemistry, National Bureau of Standards:

1. J. V. Bailey
2. C. Blundell
3. T. J. Brady
4. M. Diaz
5. L. P. Dunstan
6. M. S. Epstein
7. J. D. Fassett
8. M. Gallorini
9. E. L. Garner
10. T. E. Gills
11. J. W. Gramlich
12. R. R. Greenberg
13. S. Hanamura
14. S. Harrison
15. E. F. Heald
16. G. M. Hyde
17. W. R. Kelly
18. H. M. Kingston
19. W. F. Koch
20. R. M. Lindstrom
21. G. J. Lutz
22. L. A. Machlan
23. W. A. MacCrehan
24. E. J. Maienthal
25. J. Maples
26. O. Menis
27. J. D. Messman
28. J. R. Moody
29. L. J. Moore
30. T. J. Murphy
31. P. J. Paulsen
32. T. C. Rains
33. H. L. Rook

Cooperating Analysts:

34. University of Tokyo, Tokyo, Japan; Y. Dokiya (NBS Guest Worker).
35. Division of Chemistry, National Research Council of Canada, Ottawa, Canada; S. Berman, A. Desaulniers, J. McLaren, A. Mykytiuk, D. Russell, and S. Willie.
36. Ibaraki Electrical Communication Laboratory, Nippon Telegraph and Telephone Public Corporation, Tokai, Ibaraki, Japan; K. Kudo and K. Kobayashi.
37. Food Research Division, Health Protection Branch, Tunney's Pasture, Ottawa, Ontario, Canada; R. W. Dabeka, A. D. McKenzie, and H. B. S. Conacher.